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ON A SINGULAR VARIETY OF THE BLACK GROUSE, *TETRAO TETRIX*, LINN.

By the Editor.

An interesting but difficult subject for investigation is the cause of variation in the plumage of birds, and the laws (if any such can be formulated) which by their operation result in the production of albinism, melanism, and other abnormalities. I do not here refer to permanent varieties, such as occur chiefly in the case of domesticated species, and whose existence has been to some extent accounted for and explained by Darwin,* but to individual variation which may or may not prove to be the first stage in the formation of some permanent variety or race; for while in some cases peculiarities of colour as well as structure are transmitted by inheritance, we frequently meet with varieties which apparently are never perpetuated. An instance of the latter kind is furnished in a specimen of the Black Grouse (*Tetrao tetrix*, Linn.) now before me, and of which a figure carefully drawn by Mr. R. Holding is here given (frontispiece). This bird, received in a consignment of Black-game from Norway in December last, was very kindly forwarded in the flesh for my inspection by Mr. Castang, of Leadenhall Market, who stated that in his lifelong experience as a game-dealer he had never met with a similar example.

The feathers of the head, neck, and breast are of the usual glossy black, but those of the upper portion of the back, scapulars,

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* 'Variation of Animals and Plants under Domestication.' Vol. ii., chap. xxii. Causes of Variability.

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and upper wing-coverts are white, with dark shafts, dark centres, and dark margins. The central portion of the back presents a much blacker appearance, in consequence of each feather being dark, with a white margin; while the upper tail-coverts are marked like the scapulars, but darker in tone. The primaries and secondaries are grey, inclining to white at the extremities; the tail-feathers white, broadly terminated with black, the white portion just above the black tips being somewhat speckled on both webs; the under tail-coverts, as usual, pure white.

Mr. Howard Saunders has remarked (Yarrell's 'British Birds,' 4th ed., vol. iii., p. 67) that "Examples of both sexes are sometimes found with an unusual amount of white about their plumage, and this is especially the case with females from northern and north-eastern localities. Males from Siberia show more white than western specimens, but beautiful examples with white-mottled breasts and wing-coverts may also, *though rarely*, be obtained in Scotland." I am inclined to think that the "white-mottled breast" denotes immaturity, as it does in the case of the Cormorant, and therefore cannot be regarded as abnormal.

We have yet, however, a good deal to learn on the subject of variation, and the causes which tend to produce it. Darwin has expressed the opinion that "Variability of every kind is directly or indirectly caused by changed conditions of life" (*op. cit.*, vol. ii., p. 255), and considered it "doubtful whether a change in the nature of the food is a potent cause of variability" (p. 257); for as he truly observes, "Scarcely any domesticated animal has varied more than the pigeon, or the fowl, yet their food, especially that of highly-bred pigeons, is generally the same."

It will be seen that these remarks apply chiefly to animals under domestication, for, in a state of nature, individuals of the same species are exposed to nearly uniform conditions, being rigorously kept to their proper places by a host of competitors, and have moreover long been habituated to their conditions of life. At the same time it cannot be said that they are subject to quite uniform conditions, and they are liable to a certain amount of variation. In the case of game-birds, doubtless those which, like the Pheasant, are brought more directly under the influence of man are more liable to variation. The Black Grouse which, except by hybridisation, varies very little, is only to be found in wild haunts far removed from human habitation.

A VISIT TO THE BIRDS' NEST CAVES AT GOMANTON, NORTH BORNEO.

By H. Pryer.*

The edible bird's-nest has long been famed as one of the most remarkable articles of the Chinese *cuisine*, and little being known concerning the place of production, I determined, during my recent trip to North Borneo, to visit the caves where the nests are obtained, to gather information on the subject, and to ascertain, if possible, the material from which the bird makes its much-prized and valuable nest.

On March 19th, at half-past ten o'clock a.m., in company with a gentleman in the employ of the British North Borneo Company, I left the flourishing little town of Elopura, at the head of Sandakan Bay, in a steam-launch for the Sapugaya River, which flows into the bay about eight miles below the town. Our party was composed of two Englishmen (W. and self), one Chinese cook, two Malay boys, three Malay boatmen, eight Sulu to act as carriers, a Buludupi guide named Buti, and my Japanese collector. The mouth of the Sapugaya was reached at noon. The banks here for some miles are lined with mangrove trees, of which there are several kinds, but all agreeing in their love for mud and salt water, and growing on trestles formed by their own roots, the tree-trunks being raised from four to ten feet above the ground. The river winds about in a most puzzling manner, and sometimes, after we had been steering due south, our course was suddenly altered due north. After the mangrove is passed, the Nipa swamps commence; this plant is like a huge fern, sending up immense fronds, sometimes 30 ft. in length; it bears a large fruit, something like a round pineapple, weighing 15lb. to 20 lb. The leaf is used for walls and roofs of houses by the natives, who prefer it to anything else for this purpose, and the young unexpanded frond makes an excellent cigarette-wrapper.

Above the Nipa, where the river-banks rise above the reach of the tide, the forest extends down to the water's-edge; it is composed of splendid forest trees of the most durable timber;

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* Reprinted from 'The Japan Gazette.'

many of them run up, perfectly smooth to the first branch, fully 200 ft. Ferns, orchids, and numbers of peculiar parasitical plants grow on their branches; in fact, owing to the impossibility of any number of plants growing in the shade of the forest, these plants have migrated to the tops of the trees for light and air. On the way up we saw some splendid Kingfishers, and an occasional Sandpiper or Curlew would fly off at our approach. Making the launch fast to the landing-stage at a sugar and coffee plantation, we took to our rowing-boat, the river beyond this point being too narrow and full of rocks and tree-trunks for the launch to proceed further. At 4 p.m. we reached our resting-place for the night; this was a shed; the roof of Nipa-leaves (called attap), and an occasional attap at the side; the floor, which is always raised about six feet from the ground, was formed of thin sticks laid loosely on a frame of poles. Notwithstanding our rough accommodation, we managed to make ourselves comfortable, and, spreading our india-rubber sheets and blankets, were soon enjoying a capital dinner prepared by our Chinese cook, who had brought along with him a goodly supply of food, and his pots and pans. After a soothing pipe, and still more soothing pull at our whisky-flask, we turned in. I was awakened once in the night by what I thought was rain, but on looking out found it was only the dew which, being condensed in the tops of the high trees, comes pattering down as soon as the air begins to warm towards daylight.

After the usual difficulty with the baggage-carriers, the largest and strongest men insisting upon carrying the smallest possible amount, we started at 7 a.m. for a five hours' walk through the forest. Shortly after the start we noticed a splendid specimen of a *Calladium;* each leaf was 5 ft. long by 3½ ft. broad, the trunk was 18 in. in circumference, and the plant stood 12 ft. high. About half-way W. had a shot at an Ourang Utan, but missed, and I did ditto to a deer. We noticed the fresh track of elephants, and the ground was in many places cut up by pigs and deer. The Argus Pheasants made the forest ring again with their loud "ku-hu-u," the Long-armed Ape (the Siamanga) was singing his morning song in the tree-tops, and the huge Hornbill, with its peculiar cries, flew overhead on loudly-sounding pinions. I was rather surprised to hear the familiar croak of a Crow, but found them just as wide-awake here as anywhere else, and could not get a specimen. Leeches were very troublesome, crawling into boots and down one's back, generally selecting awkward places to bite; and the legs of the whole party were speedily streaming with blood. At first I found every bite very painful, but after a time this ceased, and on turning down my stockings frequently found a horrid leech fully gorged, whose unwelcome presence I had not suspected. The track is fairly level, and crosses several small streams, which had, however, now dried up into a succession of small pools, full of pretty fish, of three species; remarkably tame, they would come up and nibble one's fingers directly the hand was placed in the water. Along the path I picked up a number of different land-shells; one very pretty kind is about two inches long, of a bright pea-green colour.

At noon we reached our destination, coming quite suddenly into the thick forest, to the foot of a sheer limestone cliff running up to 900 ft. In this cliff the caves are situate. The path leads directly to the mouth of the great cavern, called Simud Itam, *i.e.* the Black Cave. The porch is rather over 100 ft. wide by 250 ft. high, and the roof slopes up for 110 ft. more; the height of this magnificent natural cathedral being 360 ft. The interior is well lighted, as there is a large circular hole in the roof about 200 yards from the entrance on the right, and a smaller one on the left, forming two aisles. The walls and roof are rugged, grand, and beautifully coloured, shading from black to brown, grey, dark yellow, red, and green; the blue sky and sunlight shining beyond through the openings make a picture far beyond my power to describe in its grand and awful beauty. Here, indeed, is a fitting temple formed by Nature to worship her in; compared with which the grandest cathedral in the world, the work of human hands, sinks into insignificance.

> "The forest growth and Gothic walls between,
> The wild rocks shaped as they had turrets been,
> In mockery of man's art."

High circling above our heads were hundreds of Bats and Swifts, and, notwithstanding the enormous heights, the nests were seen in clusters attached to the sides and roof. Here and there, from seemingly the most inaccessible places, were the rattan stages, ladders, and ropes of the nest-gatherers. Indeed, until we solved the mystery on ascending the cliff from the outside, by finding many smaller caves connected with the roof of Simud Itam, it seemed impossible for the Malays to have reached these places unless they too, like the Swifts, could fly, We gazed and gazed at the wonderful scene around and above us, but as we had to ascend far up the cliff we started on our perpendicular climb; in this we were assisted in many places by ladders fixed to the rock, and at others by projections formed by the rugged nature of the limestone, which was weather-worn into many fantastic shapes.

After an ascent of nearly 400 ft. in the glowing sun, the mouth of the white cave, Simud Putih, is reached; it is immediately over the right-hand circular opening in the roof of Simud Itam; this cave is the main entrance for the Swifts, and they were flying in and out in numbers. This entrance is about 40 ft. high by 60 ft. wide, and here live most of the nest-gatherers, together with the company's guard of soldiers. The scene was most picturesque, and the brightly-coloured and varied costumes of the men, all of whom were armed with either rifle, spear, or kris, reminded me very forcibly of the scene of the robbers' cave from a Christmas pantomime at home, ten thousand miles away. The head man placed at our disposal a raised platform of sticks, similar to that already described, built inside the mouth of the cave. Here we took a rest, as the climb had made everyone stream with perspiration. On the way up my Japanese had captured a very fine grey and white snake 6 ft. long, much to the horror of the Malays, who, as usual, said it was poisonous; but to convince them it was not I allowed it to bite me, without any bad effect.

As soon as I was cool enough I sallied out to try and find the material the nests are made from, this being the main object of my journey. In this I was very speedily successful, and my only wonder now is that it should ever have been supposed to be such a great mystery. The nests are made from a sort of fungoid growth that encrusts the limestone in all damp situations; it grows about an inch thick, outside dark brown, but inside white; the birds make the black nests from the outside layer, and the best quality of white nests are of course from the inside; it is taken by the bird in the mouth, and drawn out in a filament backwards and forwards, like a caterpillar weaving its cocoon. The natives are under the impression that the bird that builds the black nest is different from that building the white nest; they pointed out two sizes of birds, asserting that the small one built the "Sarong Putih" (*i. e.*, white nest), and the larger the "Sarong Itam" (*i. e.*, black nest). This, however, is a mistake, the difference in size being that usually found in the two sexes of all birds. I collected here a number of land-shells I had not seen down below in the forest, and noticed many ferns, begonias, orchids, and other plants new to me.

The Malays told me to be sure to return at five o'clock, as I should then see the most wonderful sight in all Borneo, the going out of the Bats and the return to roost of the Swifts. I accordingly took my seat on a block of coral limestone at the mouth of the cave at a few minutes before five; soon a rushing sound was heard, and, peering over the circular abyss leading into Simud Itam, I caw columns of Bats wheeling round and round the sides in regular order; at a quarter past five they began to circle up, rising into the air in a corkscrew flight, which led them round a high tree growing on the side of the chasm opposite; having reached a certain height, a detachment would break off and fly away rapidly. I counted nineteen flocks go off like this, each flock consisting of many thousands, and then they commenced to pour away in a continuous stream, and continued to do so until it was too dark for me to see them any longer. At a quarter to six the Swifts began to come into Simud Putih, at first in tens, then hundreds, and at last they, too, streamed in continuously; and when I went to sleep at midnight they were still flying in in undiminished numbers. As long as there was any daylight left, I found it impossible to catch any with my butterfly net, but as soon as it was quite dark it was only necessary to wave the net in the air to secure as many specimens as I wanted, although they must possess wonderful powers of sight in the dark to fly about in the deepest recesses of their caves and return to their nests, in places where no light ever penetrates.

Shortly before sundown a pair of Kites made their appearance, and taking their station over the bat chasm would every now and then clumsily swoop down into the thick of the Bats, generally securing a victim every time. I shot both these marauders, which proved to be *Haliaster indus*, a very beautiful but common bird; head and breast pure white, back and wings bright chocolate. There were also several specimens of a Hawk about, and woe betide the unfortunate Bat that, becoming separated from its flock, was put in chase. The way these Hawks took the Bats one after the other was astonishing, and strongly reminded me of a man eating oysters. I shot several of these Hawks, but only succeeded in getting one, the rest falling over the side of the cliff. It proved to be the scarce *Machærhamphus alcinus*, remarkable for the size of its gape and shortness of its beak, very much resembling the Swallow, being accustomed to take its prey in the same manner while on the wing. Among the Bats were three albinos, called by the Malays, "the rajah, his son and wife."

Arising before daylight we witnessed a reversal of the proceedings of the previous night, the Swifts going out, and the Bats coming home. These latter literally "rained" into their chasm for two hours after sunrise; looking up in the bright sky, numbers of small specks appear; these flash down perpendicularly with great rapidity, and disappear in the darkness. Several *M. alcinus* put in an appearance, hawking after the Swifts which they had rarely tried to catch the night before, the Swift then being as a rule easily able to avoid them. Their plan now was to swoop down from the mouth of the cave, striking into and following the stream of the birds, being successful once in every three swoops. I secured many specimens of the Bats, and found them to be all of one species; the caudal membrane extends only half down the tail, which is free for an inch and a half, giving the animal, when the wings are folded up, very much the appearance of a mouse. The wings are very long and narrow, and it is a very swift flyer.

After breakfast we started for the summit of the cliff; the path, which is about two feet wide, overhangs the Bat Cavern. I must confess I took a very tight hold of the rock when looking down, the bottom being lost in the darkness, at this point 600 ft. below. We ascended between 200 and 300 ft. more, and then found ourselves on the summit; here a most lovely extended view in every direction except the north; miles and miles of forest, broken here and there by mountain-tops. Unfortunately Kina Balu, the highest mountain in Malaysia, was hidden by clouds. To the north we could trace the sea, and were much surprised to find how short a distance we had actually covered, although we travelled continuously thirteen and a half hours by launch, boat, and walking. Elopura was visible with a glass, and not more than twenty miles off in a direct line. Sandakan Bay extended to within twelve miles of where we stood, and the beautiful islands of Pulo Buy and Balhalla, covered with all the most lovely tropical vegetation, fit abode for fairies, stood out in the shining sea. On the highest point the Malays have built a house, into which we were invited, and we examined a quantity of very fine white nests, gathered from a small opening close by; which is, however, 110 fathoms deep, and connects with Simud Putih, our resting-place of the night before. We then commenced the descent by another track, and found it much easier work than going up. About 200 feet below the summit we reached a large opening looking exactly like a railway-tunnel; lighting our candles, and attaching them to the lower part of the staves each of us carried, we entered the gloomy portal and soon lost daylight, the path becoming steeper and more and more slippery the further we descended. About 500 ft. from the entrance it got unpleasantly warm, and the atmosphere stifling, the guano deposited giving out a most disagreeable smell. We were here shown a small beam of light from the funnel at the top of the rock, exactly 696 ft. above us.

Owing to the guano, our footing became very precarious, and we had to balance ourselves on poles laid on the surface. How deep this guano is is not known; a long spear, used by the natives for nest-gathering, does not touch the bottom when thrust in up to the hilt. Just when matters were getting unbearable, the cave turned to the left and commenced to ascend; we were very glad to find that Simud Putih had been reached, and we shortly emerged again into the daylight, very much dazzled. All the roof of the dark parts of the cave was occupied by the birds, who keep up an intermittent twittering, sounding, from the immense quantity of birds assembled, like the surf breaking on a rocky shore. We saw the nest-gatherers getting in their crop; they had extended their flexible rattan ladders over some horrible-looking gulfs and fixed them against the sides: two men take their station on these; one carries a light four-prong spear, about 15 ft. long; just below the prongs a lighted candle is fixed; holding on to the ladder with one hand, the spear is managed with the other, and the nest transfixed; a slight push detaches it from the rock; the spear is then withdrawn until the head is within reach of the second man, who takes the nest off the prongs and puts it in a pouch carried at the waist.

We again took up our quarters for the night at the mouth of Simud Putih, and after dinner, in course of conversation with the head men, elicited a few facts about the caves. The annual value varies from 25,000 to 30,000 dols.; they had been worked for seven generations without any diminution in the quantity; three crops were gathered during the year; accidents to the men employed very rarely occurred, notwithstanding the dangerous nature of their occupation; unless a considerable quantity of black nest is gathered, the supply of white nest falls off. There is an almost inexhaustible supply of guano in the caves, and the number of bats and birds in them is so enormous that, if they are undisturbed, a regular quantity may be taken out yearly.

On March 22nd we left our cave at 7 a.m., and after a farewell visit to Simud Itam commenced our return journey. During our walk we saw Deer, Monkey, and one splendid Fireback Pheasant. We reached the Sapugaya River shortly before twelve noon, and were disappointed at finding the tide out and our boat high and dry; we waited patiently until half-past four, but as there was still no sign of a return of the water we determined to try and carry the boat down until water sufficient to float her was met with; this we eventually succeeded in doing, our Chinese cook greatly distinguishing himself on this occasion, although a remarkably thin and weedy-looking individual. As luck would have it, he had one end of a pole slung across the boat, and the strongest Sulu, a fine strapping young fellow, the other. They placed the pole in position; up went the Chinaman, down went the Sulu; the Sulu got up looking very fierce, rubbed his shoulder, set his teeth, and tried again, with the same result; we soon found that our opium-smoking Celestial was more than a match for any of our men at lifting. Just at dusk we reached our steam-launch. Several of that very peculiar animal, the *Galeopithecus*, were floating from tree to tree, and a very large Bat was flying about. We soon got up steam, and at 10.30 p.m. reached the pier at Elopura.

ORNITHOLOGICAL NOTES FROM NORFOLK & SUFFOLK.

By T. E. Gunn, F.L.S.

The following notes, made during the past year, are offered in continuation of those published in 'The Zoologist' for January, 1884:—

Peregrine.—A female in the second year's plumage was shot by a gamekeeper near Harleston on January 12th, 1884. The bird weighed two pounds six ounces. On dissection I found it very fat, the crop and stomach being filled with the remains of a Wood Pigeon, the weight of food in its crop being three ounces and a half.

Merlin. — An immature male was shot at Catton, near Norwich, on October 11th, 1883. Females in this plumage, as also in the adult state, are more frequently met with than males.

Sparrowhawk. — On June 28th, 1884, I took a nest of young Sparrowhawks containing six young birds, which is rather an unusual number for one nest (four or five being the ordinary complement). I also secured the parent birds. I had visited the nest on June 15th, and found the eggs cracked round the larger end; the young were doubtless hatched the following day. Thus the nestlings when taken would be just twelve days old, at least the larger birds would. These were more forward in plumage than the smaller ones, and proved on dissection to be of the female sex, the smaller birds being males; the proportion of the sexes being four of the former to two of the latter. I have invariably noticed in nests of the Raptores (both hawks and owls) not only that the females are in greater preponderance, but they are apparently hatched first. These nestling females showed their new feathers partly issuing from the soft quills of wing and tail, the feathers in the males being less developed in one and scarcely started in the other. The parent birds, I was somewhat surprised to find, were breeding in their immature plumage, being but twelve months old when they paired; this, I imagine, is unusual. A few dark slate-coloured feathers here and there had just made their appearance in the back and upper parts of the plumage of each, also two new short centre feathers in the tail of the male; the rest of the feathers exhibited the usual margins indicative of immaturity. The cere, legs, and toes were pale yellow, but deeper in shade than during the first year; eyes deep lemon-yellow; the eyes of the young birds were leaden-grey; legs and toes buffy-white. In the stomach of the female parent I found the bills and other bones of two Greenfinches, which I was enabled to identify by some feathers which I rinsed and dried. The nest, compactly built of sticks, was situated in one of the upper branches and close to the trunk of a Scotch fir. The gamekeeper seemed rather anxious that this pair of birds should be killed, as the previous day they had been watched passing backwards and forwards to his coops, from which he found they had taken just twenty young pheasants, the male bird being particularly active in this performance. Remains of some of the young birds were found in the crops of the nestling hawks, as well as in a few cast-off pellets beneath their nest.

Food of Owls. — On dissecting an adult female Short-eared Owl, killed at Caister, near Norwich, on January 1st, 1884, I found in the stomach the remains of a half-grown brown rat and an adult field-mouse, including the skulls and leg-bones of each. On the 8th of the same month the stomach of another Tawny Owl contained the remains of a sparrow.

Variety of Barn Owl.—On November 13th, 1883, a beautiful dark variety of the Barn Owl, a female, was shot near Norwich and brought to me. The whole of the under surface of its plumage was of a rich buff instead of the ordinary white; the face white; the back and upper parts of the plumage were also many shades darker than in the usual type. I recorded a similar variety in 'The Zoologist' for 1880, p. 49. Birds of this variety of *Strix flammea* are evidently migrants. The two just mentioned and three others I have had in my possession all occurred earlier or later in the autumn.

Albino Missel Thrush.—An albino immature bird of this species was killed on May 26th, 1884, at Leiston, near Saxmundham, and forwarded to me. The plumage was entirely white, the usual round spots of the breast-feathers being indicated by the faintest tints, reminding one of the water-marks in note-paper. It had pink eyes, and the bill and legs were yellowish white. When skinned I found a thread-worm (*Filaria*) of five inches in length protruding from a wound in its breast, and on dissection obtained a few smaller ones, as well as a tape-worm from the intestines. On dissecting a young Thrush that had been killed in a market-garden near Norwich, on July 21st, I found its stomach filled with ripe white currants, of which I counted as many as thirty; it also contained a small garden-snail, which it had swallowed without breaking the shell.

Firecrest and Goldcrest.—An adult male of the former species was brought me from Attlebridge, near Norwich, where it had been captured on November 29th, 1879. Having been just killed, it was in a perfectly fresh state and in splendid plumage. Having sold it to a customer immediately I had mounted it, I omitted placing it on record; and Mr. J. H. Gurney having since seen it, suggested that I should do so (although late), and add it to these notes, which I now have the pleasure of doing with the following particulars from my notes made at the time:—Total length, 4 in.; tip to tip of fully-extended wings, 6⅝ in.; wing from carpus, 2⅛ in.; tail, 1½ in.; bill, 5-16ths in.; tarsus, ¾ in.; tibia, 13-16ths in. The stomach was empty. It proved to be somewhat larger than a Goldcrest with which I compared it, placing them side by side. I have the following note on an unusually large example of the Goldcrest, an adult male, shot at Lynn on January 1st, 1884, and posted to me:—Total length, 4¼ in.; wing from carpus, 2⅛ in.; fully-extended wings, 6½ in.; bill, 5-16ths in.; tarsus, ⅝ in.; it weighed 2 drms. (apothecaries' weight).

Brambling. — When reading Mr. O. V. Alpin's note (Zool. 1884, p. 341) on the occurrence of the Brambling in Oxfordshire on March 16th, a date which he considers unusually late for this species to stay, I referred to a specimen, an adult male, in my collection, which I find according to its label and entry in my note-book was shot by myself on April 10th, 1872, at Beeston Regis. There were five or six of these birds on the top branches of a fir, and when I secured this one to make sure of the species I did not follow the others, which then flew to another fir a short distance off.

Shore Lark. — On February 11th, 1884, I received a female bird of this species that had been shot in the neighbourhood of Twyford.

Kingfisher. — On August 9th last I dissected a Kingfisher, and found in the stomach a few fish-bones and remains of a "water boatman" (*Notonecta*), and other aquatic insects. On

November 30th, 1883, I found in an adult female Kingfisher a stone-loach which measured three inches in length; the head of the fish lodging in its stomach was decomposed; the rest of the fish being in its gullet was comparatively fresh, and therefore easily recognised.

Spotted Woodpecker. — *Picus major*, seems to be on the increase in the eastern counties; an unusual number was killed between November, 1883, and the end of March, 1884, in different parts of Norfolk and Suffolk, and I observed several pairs nesting in the fir-plantations within a few miles' radius of Norwich. Being rather a shy bird, it requires a great deal of patient watching to detect its presence. The increase of this species, as also that of the Long-eared Owl, is doubtless due mainly to the strict preservation of game, and the comparatively quiet state of the woods and plantations during the nesting season.* To this cause is also doubtless due the additions noted in the numbers of the Lesser Spotted Woodpecker; these birds have been steadily increasing for the past three or four years. An adult male *Picus minor* was shot whilst flying over a field adjoining Unthanks Road, just on the outskirts of Norwich, on the afternoon of September 19th last. On dissection I found in the stomach a larva of the wood leopard moth (*Z. æsculi*) and the remains of another; this insect seems to be a favourite food with both *Picus major* and *minor* (see Zool. 1884, pp. 6, 7).

Spotted Redshank. — Four Spotted Redshanks, *Totanus fuscus*, were killed out of a "bunch" of seven by one shot from a swivel gun by Mr. Ward, of Lynn, in that neighbourhood, on October 28th, 1883. I found two of them to be adult, and two in immature plumage. The sexes and weights were as follows:— Immature male, 6½ oz.; adult male, 7 oz.; adult male, 7 oz.; immature female, 8 oz.

Ruff. — A Reeve came to hand on January 5th, 1884, just killed on the coast at Aldborough, Suffolk. The ovary contained from twenty to thirty eggs about the size of an ordinary pin's head, and in the stomach were the remains of some insects and fibrous substance. In the gullet I found a caddis-worm and its case entire. The bird was fat and in good feather. On September 17th, 1884, a Ruff was killed at Stalham. The stomach contained seven or eight pebbles, and remains of insects.

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* The increase referred to is more likely to be due to migration, as no unusual efforts at game-preserving have been made of late years.—Ed.

Little Crake.—A bird of this species which I exhibited at a meeting of the Norwich Science Gossip Club on January 5th, 1881, was shot on the marshes near Hickling Broad on October 25th, 1880; it is the bird referred to by Mr. Stevenson (Zool. 1882, p. 374), and was forwarded to me for preservation when quite fresh by Mr. Randall Johnson, who afterwards presented it to Mr. B. C. Silcock, of Stalham. It is a rare British species, though probably occurring more frequently than is generally supposed, owing to its minute size, stealthy habits, and power of secreting itself amongst the tall grass and sedges of our extensive marshes and broads. On dissection I ascertained it to be a female. The gizzard was small and somewhat muscular; it contained the remains of minute insects, including the elytra of some small beetles and an entire minute fly, a few small seeds, particles of grit, and small stones. Total length from tip of bill to end of tail, 8 in.; bill, $\frac{3}{4}$ in.; wing from carpal joint to tip, $3\frac{7}{8}$ in.; from tip to tip of fully-extended wings, $11\frac{3}{4}$ in.; tail, $2\frac{3}{16}$ in.; tibia, $1\frac{3}{4}$ in.; tarsus, $1\frac{3}{16}$ in.; middle toe and claw, $1\frac{11}{16}$ in.; weight, $1\frac{3}{4}$ oz.

Waxwing. — The Rev. S. N. Micklethwait, of Hickling, informed me of the occurrence of this uncertain visitor to his garden in January, 1884. He was sitting in his dining-room on the 20th of that month, and looking out of the window saw four birds feeding on the berries of a yew-tree within a few yards of him, which he immediately recognised as Waxwings, being well acquainted with the species and having specimens in his collection.

Bittern. — A fine male Bittern was shot on January 9th, 1884, near Stalham, and sent to me for preservation. It was exceedingly fat, and weighed three pounds six ounces. In its throat I found the remains of a water-beetle, *Dytiscus marginalis*, with the elytra quite perfect; the stomach contained the bones of a small pike and roach, the remains of another *Dytiscus*, and some bits of reed.

Heron. — On February 7th I received an adult male from Weston. In its stomach I found a dace weighing six ounces and a half, and measuring eight inches and a half in length; the fish was a female, with the roe forward in development. Attached to its gills I found several tape-worms averaging about five inches; the fish was broken across the shoulders by the strong beak of its captor previous to being swallowed, and was doubled-up in the bird's stomach; from the fish's intestines I took an entozoon six inches in length, and a quarter of an inch in breadth; this was alive and uninjured, and thus bears out the fact of these parasites being introduced from one host to another.

Coot.—On November 6th, 1883, a Coot was caught in one of the signal-cords of a railway-carriage at Thorpe Station, on the Great Eastern Railway. The bird had by some means entangled its legs, and was held a prisoner until released by a porter, who brought it to me. It lived four days without food, refusing all kinds of tempting morsels placed before it. The stomach contained a quantity of silt, and a small bivalve or two.

Egyptian Goose. — An adult male, brought me on January 24th, 1884, was shot on the marshes at Cringleford, near Norwich. It exhibited no symptoms of having been kept in confinement, but whether a genuine migrant or a wanderer from some lake in the county it is impossible to say. The Egyptian Goose has been repeatedly shot both on Breydon and in the Yarmouth Roads, and is often seen during the winter migration along the eastern coast.

Goosander. — This species was unusually abundant during the winter of 1883-84 in the eastern district. I received an adult female from Oulton Broad on December 14th; in this I found two perch, one measuring seven inches and the other five inches and a half in length. When pike-fishing on Kimberley Lake on February 4th, 1884, I counted fourteen of these birds, which I examined with my glass, one being an adult male; these and a number of wild duck were consorting with the semi-domesticated fowl on the water. The old keeper told me the Goosanders had been there several weeks; they seemed well able to take care of themselves, something like two hundred yards being the nearest approach allowed. On the 19th of the same month a pair of adult Goosanders were killed at one shot on a small lake in Honningham Park; the female was sent to me the following day quite fresh; the male, however, was not found until four days later in a reed-bed, by which time decomposition had set in; however, by careful treatment I managed to preserve it. Lady Bayning, the owner, informed me that the two birds had been observed on the lake for some days prior to their being killed by her gamekeeper. In the throat and stomach of the female I found two roach of five and six inches, and the remains of a third roach. The male had also been feeding on small roach, and the bodies of both were in good condition and covered with fat. I omitted to mention in my previous notes that on February 20th, 1883, I received an adult male Goosander, killed on Gunton Lake, where it was found in company with six or seven grey birds of the same species.

Polish Swan.—An immature female Polish Swan was killed at Wramplingham on March 22nd. Weight, 15 lbs.; length, 4 ft. 8 in.; tip to tip of fully-extended wings, 7 ft.

Wild Geese. — On November 29th, 1883, a large flock of Geese passed over the city of Norwich about 2 p.m., in the direction from N.W. to S.E. I kept them in sight for about two minutes, and as they passed over probably some two hundred yards high I could distinguish them as Canada Geese, at least the right hand wing, as the flock flew in V-shape contained thirty individuals of this species. These were in all probability escaped birds bred on the ornamental waters in various parts of this country, and being unpinioned they collect together and either migrate or wander away. The entire flock consisted of eighty-three or eighty-four birds, as variously counted by different observers. Smaller flocks of Canada Geese consisting of ten or twelve or more not unfrequently at this time of the year in various localities in Norfolk. Three winters ago a flock of eighteen were seen passing over Heigham Causeway, two or three of which were shot. Seven swans, reported to be Whoopers, but probably unpinioned Mute Swans, were seen on the River Wensum at Hellesdon on November 26th, 1883, but none of them were killed.

Black Tern. — It was my intention to have corrected the error occurring in the local name of the Black Tern as given in my former notes (Zool. 1884, p. 8), in which a "w" is inserted instead of an "r," rendering the word "Daw" instead of "Dar," evidently a printer's error. This shows how very necessary it is to write plainly. I am obliged to Mr. Southwell, who anticipated my correction (Zool. 1884, p. 144), and who states that "Terns were all formerly known as Dars." I may add that the Breydon gunners with whom I am acquainted still apply the name Dar to three Terns, *viz.*, the Common, Black, and Lesser Terns.

BIOLOGICAL STATIONS FOR THE OBSERVATION OF MIGRATORY BIRDS.

THE nature of the services rendered by the Committee appointed by the British Association to collect observations on the Migration of Birds is now fully recognised and appreciated, thanks to the excellent Reports which the Committce have annually published since the subject was fairly taken in hand some five years since; but our readers may not be so well aware of the steps which have been taken in the same direction by naturalists on the Continent. We therefore append a translation of a German circular on this subject which has lately reached us, and which is interesting not only because it shows what our German friends are doing in the matter, but also because it contains suggestions which deserve the consideration of observers in this country. It is issued by Dr. Rudolf Blasius, of Brunswick, and runs as follows:—

An Appeal to the Ornithologists of Germany.

At a Meeting of the General Ornithological Society of Germany, held at Brunswick nine years ago, on the proposition of Dr. A. Reichenow (warmly seconded by the late Dr. A. Brehm), it was resolved that a Committee should be formed for organising stations for the observation of birds in Germany. Seven Annual Reports have since appeared, bearing witness to the unceasing activity of the Committee and its correspondents. A great number of observations have been collected together; but there still remain many gaps in our knowledge of German bird-life which should be filled up. The example set by Germany has been followed by many other countries; in England, America, Austrian-Hungary, and Denmark, ornithological committees have been formed, which publish similar Annual Reports from information supplied from a series of stations for ornithological observations. At the first International Ornithological Congress, held at Vienna in April, 1884 [see Zool. 1884, pp. 139, 188, 346], a resolution was passed for the formation of a permanent International Ornithological Committee, which should superintend arrangements for similar stations in every inhabited country of the world. Under the patronage of his Royal and Imperial Highness, the Crown Prince Rudolph of Austria, the President of this Committee, Dr. R. Blasius of Brunswick, and the Secretary Dr. G. von Hayek, of Vienna, are endeavouring, in conjunction with a number of well-known ornithologists of all nations, to obtain a universal acceptance of the scheme. A noble rivalry will be kindled, and Germany must not be left behind. We have yet much to learn; and if everyone who knows anything of bird-life in his own district will send his notes on the subject, much may be accomplished. Observations apparently trivial may be of use, and find place in the Annual Report.

We would call attention to the following instructions as a basis for making observations, together with those already issued by Herr E. von Homeyer and ourselves for Germany, and Herr von Tschusi for Austrian-Hungary:—

I. *Boundaries of the locality under observation.*—Give, if possible, a short description of its topographical position, with the exact latitude and longitude.

II. *Occurrences.*—(1) What birds are you acquainted with, and what are their local names? (2) Which species remain the whole year in the same place? (3) Which species change their abode according to the time of year? (4) What species do you observe only in passing over in spring, or autumn, or at both seasons? (5) What species breed in your district during summer, and leave at the approach of winter? (6) What species do you observe only in winter? (7) What species do you regard as of rare occurrence only, and what do you consider to be the cause of their appearance? (8) What species appear occasionally singly or in numbers? (9) What species appear simultaneously in the valleys and on the mountains; and at what height on the mountain are they seen? (10) Have you observed any striking increase or decrease in any particular species, or that the increase of one species is accompanied by the decrease or disappearance of another? Has this occurred in consequence of a change of conditions in the habitat of each species, or from what other cause? (11) Are common birds (for instance, sparrows, swallows, magpies, &c.), scarce in your district; if so, what reason can you assign for such scarcity? (12) Have you observed any summer birds during winter, or winter birds during summer; if so, of what species? (13) Have you observed in certain species any peculiar change of colour; mules or hybrids? (14) Have you noticed any bird, that you could identify by certain peculiarities, which has returned year after year to the same spot?

III. *Migration.*—With regard to the migration of birds, the following points should be noted:—(1) Day and hour of the first arrival; (2) of the arrival of the main flock; (3) of arrival of stragglers; (4) of commencement of departure; (5) of departure of main flock; (6) of departure of stragglers. (7) Mention any species that you have observed to depart in spring, and the probable cause of such departure. Did the movement extend to every individual of the species, or only to a limited number? When and in what sort of weather did they reappear? (8) Note the direction of the birds' flight in general, and that of each species in detail. (9) Weather and wind on day of taking observation. In the case of any extraordinary flight, note the state of the weather on the days preceding and following it. (10) Which species have you observed to fly with the wind, and which against it? (11) What localities are selected as resting-places by certain species? Do these differ according to the time of year; and what do you consider to be the reason of their choice? (12) Have you noticed whether male and female, or young and old birds of a particular species fly together or separately? (13) What species appear singly, in pairs, in family parties, or in flocks? (14) What species have migrated to your neighbourhood or disappeared; when did this take place; and what do you take to be the reason? (15) Is the direction of their flight affected by the course of any river, the windings of a valley, or position of hills? When a hill stands in the line of flight, do the birds fly over it or go round it? (16) Which species avoid any such obstacle, and which fly over it?

IV. *Breeding.* — (1) How often in the year does each species breed? (2) At what date was each "clutch" found, and how many eggs in each? (3) What interval occurred between the depositing of each egg? (4) How long was the period of incubation? Did the male take part in it, and if so, when did he relieve the female? (5) Do the eggs laid by young birds differ in colour and shape from those of old ones? (6) Which species use the same nest for a second brood, in the same or following year, and which build a new nest? (7) What localities are preferred by certain species for nesting in; at what height are the nests found; and of what materials are they composed? (8) What species have built abnormal nests, or in unusual places? What cause can be assigned for this? (9) Have you any large breeding-colonies of Herons, Gulls, Sea-swallows, Rooks, Sand Martins, &c., and if so, in what localities? How many pairs are there on an average in these colonies, and do they increase or decrease in numbers?

V. All kinds of biological observations, as well as notes on moulting, food, utility or otherwise, song, &c.; even single instances are useful.

After the Ninth Annual Meeting of the General German Ornithological Society at Berlin, this Committee hopes to publish charts of the geographical distribution of the birds of Germany, and possibly of existing routes of migration. The following species will be taken first, and any reliable information as to their place of breeding, on the basis of the above instructions, will be acceptable:—

Lesser Kestrel	*Cerchneis cenchris*, Naum.
Black Kite	*Milvus ater*, Gmel.
Short-toed Eagle	*Circaetus gallicus*, Gmel.
Eagle Owl	*Bubo maximus*, Sibb.
Roller	*Coracias garrula*, Linn.
Grey-headed Green Woodpecker	*Gecinus canus*, Gmel.
Black Woodpecker	*Dryocopus martius*, Linn.
White-backed Woodpecker	*Picus leuconotus*, Bechst
Starling	*Sturnus vulgaris*, Linn.
Carrion Crow	*Corvus corone*, Linn.
Hooded Crow	,, *cornix*, Linn.
Rook	,, *frugilegus*, Linn.
Lesser Grey Shrike	*Lanius minor*, Linn.
White-necked Flycatcher	*Muscicapa albicollis*, Temm.
Red-breasted Flycatcher	,, *parva*, Linn.
Goldcrest	*Regulus cristatus*, Koch.
Firecrest	,, *ignicapillus*, Brehm.
Bonelli's Warbler	*Phyllopneuste bonellii*, Vieil.
Great Reed Warbler	*Acrocephalus turdoides*, Meyer.
Grasshopper Warbler	*Locustella nævia*, Bödd.
River Warbler	,, *fluviatilis*, Meyer.
Barred Warbler	*Sylvia nisoria*, Bechst.
Fieldfare	*Turdus pilaris*, Linn.

Rock Thrush	*Monticola saxatilis*, Linn.
Nightingale	*Philomela luscinia*, Linn.
Stonechat	*Pratincola rubicola*, Linn.
Whinchat	,, *rubetra*,
Common Bunting	*Miliaria europæa*, Swains.
Ortolan	*Emberiza hortulana*, Linn.
Rock Sparrow	*Pyrgita petronia*, Linn.
Serin	*Serinus hortulanus*, Koch.
Capercaillie	*Tetrao urogallus*, Linn.
Black Grouse	,, *tetrix*, Linn.
Hazel Hen	,, *bonasia*, Linn.
Little Bustard	*Otis tetrax*, Linn.
Little Bittern	*Ardetta minuta*, Linn.
Great Snipe	*Gallinago major*, Bonap.
Shoveller	*Spatula clypeata*, Linn.
White-eyed Pochard	*Fuligula nyroca*, Güld.
Cormorant	*Carbo cormoranus*, Meyer.
Black-headed Gull	*Larus ridibundus*, Meyer.

In order to determine the route of migration, special attention in spring and autumn may be directed to the following well-known species:—

Kite	*Milvus regalis*, auct.
Swift	*Cypselus apus*, Linn.
Swallow	*Hirundo rustica*, Linn.
Cuckoo	*Cuculus canorus*, Linn.
Thrush	*Turdus musicus*, Linn.
Redwing	,, *iliacus*, Linn.
Skylark	*Alauda arvensis*, Linn.
Lapwing	*Vanellus cristatus*, Linn.
Crane	*Grus cinereus*, Bechst.
Stork	*Ciconia alba*, Bechst.
Greylag Goose	*Anser cinereus*, Meyer.
Bean Goose	,, *segetum*, Meyer.

Brunswick, November, 1884.

The Chairman of the Committee of Stations for the observation of Birds in Germany is Dr. Rudolf Blasius of Brunswick.

NOTES AND QUERIES.

The late Dr. Gwyn Jeffreys, F.R.S.—It is with great regret that we have to announce the sudden death from apoplexy, on January 24th, of Dr. John Gwyn Jeffreys, F.R.S., the well-known conchologist, who had only a few days previously attained his 76th year. On the evening of January 20th he read a paper before the Zoological Society, when he appeared in his usual health and spirits, and on the evening before his death was present at the Royal Institution to hear a lecture by his son in law, Professor Moseley. His unexpected demise will evoke a very wide-spread feeling of regret not only amongst a large number of private friends, but in a wide circle of scientists both at home and abroad to whom he has long been well known through his publications. Dr. Jeffreys was born at Swansea in 1809, and for some years, prior to his being called to the Bar at Lincoln's Inn, practised as a solicitor in that town. His tastes, however, were rather scientific than legal. At nineteen he wrote "A synopsis of the Pulmonobranchous Mollusca of Great Britain," and in the following year was elected a Fellow of the Linnean Society. He became a Fellow of the Royal Society in 1840. In 1869, 1870, 1871, and 1875, he either conducted or took part in exploring voyages in the North Atlantic and on the north-eastern coast of the United States. In 1880 he joined the French Sounding and Dredging Expedition in the Bay of Biscay. Dr. Jeffreys wrote over a hundred papers on scientific subjects; but he is probably best known by his principal work, "British Conchology," in five volumes. An assiduous attendant of the meetings of the British Association since 1836, he was the local treasurer at Swansea in 1848, president of the Biological section in 1877, and one of the vice-presidents of the last meeting at Swansea.

BIRDS.

Bird-life in Wanstead Park, Essex.—Wanstead Park, which has been thrown open to the public within the last few years through the action of the Corporation of London, is remarkable, considering its proximity to the metropolis, for the variety of birds that frequent its woods and waters; for the great city with its suburbs extends in an unbroken stretch of houses to within a quarter of a mile of the park-gates. The Herons, however, continue to arrive in early spring in undiminished numbers of from forty to fifty, and nest in the tall trees on an island surrounded by the broad ornamental waters. These trees also contain the largest rookery in the neighbourhood, and afford nesting-places for numbers of Jackdaws, Wood Pigeons, and a few Carrion Crows and Turtle Doves. Among the undergrowth Moorhens abound, notwithstanding that a Fox has for a length of time taken up his quarters in this secluded part; but as there are plenty of rabbits he may perhaps leave the birds alone. Dabchicks come in the spring and breed, but appear to leave us in late summer. Coots bring up two broods every year, and are so tame that they hardly keep beyond the range of the floats of the boys who come to fish in the unpreserved ponds. Jays are very frequent, but they retire to breed in the denser parts of the forest. Kingfishers are seen occasionally, and the Nuthatch is not uncommon; while Tree Creepers, Golden-crested Wrens, and the various Tits and Finches abound. The summer migrants are well represented, and I have seen years ago a passing Ring Ouzel; but perhaps the wild winter visitors are the most interesting. Some years ago a Red-necked Grebe came to the Basin, a large piece of open water in the park, where I watched it with a telescope for several days. I have also seen, on the same water, a female Great-crested Grebe, a Red-throated Diver, and a flock of Scaups. Last year a Pochard and four Tufted Ducks remained for more than a month on the lower ponds, where there is good cover of rushes; they kept company with the Coots, and, though at first shy, they became curiously tame by the example of their companions. This year the Basin has been visited by about a score of Wild Ducks and a flock of fifteen Goosanders in immature plumage, which remained for five days. It was an interesting sight to watch the graceful fishing operations of these birds with a good telescope. After swimming in a compact company for a considerable time, they would all suddenly commence diving, probably having come over a shoal of fish, for many would be seen emerging with a fish in their bills, and, if one was too large to be immediately swallowed, a scramble would take place, and it would change beaks several times before being finally disposed of. To be quite sure of the species of the bird I made a coloured drawing from our telescopic observations, and compared it with the specimen in immatnre plumage at the South Kensington Museum, when the correspondence was exact; it also agreed perfectly with the description in Yarrell. They left us on the 8th of this month (December). On the 15th we watched a small flock of Teal on one of the smaller ponds, and within the last few days have noticed Snipe, the Common Sandpiper, a Water Rail, and the Grey Wagtail; the latter bird is frequently seen here in the winter. One of the ponds is fringed with large alders, and during the last week these trees have been frequented by a flock of Siskins, among which we have noticed a few Lesser Redpolls; a pair of the latter were busy with the birch catkins in a copse close to the high road. During the winter months Peewits and Golden Plovers come in large numbers to the extensive and highly manured fields in this neighbourhood; on the 16th March last year a flock of about a hundred Golden Plovers frequented the park and its vicinity, and we noticed that a fair proportion of the birds had already acquired the deep black on the front of the neck and breast; they were in company with a host of Peewits and Fieldfares, making a fine group as seen through the telescope.—ARTHUR LISTER (Leytonstone).

Icterine Warbler in Norfolk.—It is as well to place on record, in 'The Zoologist,' particulars of the capture of a British specimen of the Icterine Warbler, *Hypolais icterina,* which was exhibited by Mr Dresser at a meeting of the Zoological Society on the 14th November last, as already noted (Zool. 1884, p. 493). The specimen referred to, as I am informed by Mr. Dresser, was shot by Mr. F. D. Power on the 11th September last near Blakeney, where he found it in a thick clump of thistles along the Cley sea-wall. It was alone at the time, although a number of Wheatears, Redstarts, and one Bluethroat were observed the same day arriving from the north, the wind being E.N.E. The sex was undetermined; the plumage indicated a bird of the year.—J. E. HARTING.

The Barred Warbler in Norfolk.—At a meeting of the Zoological Society, held on the 4th November, 1884, the Rev. H. H. Slater exhibited a specimen of the Barred Warbler, *Sylvia nisoria,* which had been obtained in August, 1884, on the Yorkshire coast, and particulars of the capture were subsequently communicated to 'The Zoologist' (1884, p. 489). At the same meeting another example of this bird was exhibited by Mr. Dresser, the history of which has not yet been noted in this Journal. It was shot by Mr. F. D. Power on the 4th September last from scrub at the base of Blakeney Sandhills, Norfolk, where Garden Warblers on migration were at that time numerous. It was the only bird of the kind observed, and proved on dissection to be a female. In plumage it closely resembled the specimen described by Mr. Slater (*l. c.*), being in fact, like the latter, a bird of the year.—J. E. HARTING.

Ornithological Notes from Somerset.—I forward a few notes of occurrences in this county during the last six months, the first I regret to state being the destruction of two pairs of the Great Spotted Woodpecker, *Picus major,* by far the least common Woodpecker in Somersetshire. They were shown to me on the 9th of July as having been shot near Taunton, both pairs being then set up and cased; in both instances the female, as far as I could see, showed signs of having been sitting, the breast of each bird being partially denuded. On the 6th of August, while driving home from Taunton, an acquaintance called to me over the hedge of his garden to come in and identify a clutch of eggs he had had brought to him that day, and which he supposed to be Quail's eggs. I accordingly went in, and found the eggs to be undoubtedly those of a Quail. My acquaintance had just blown some of them, which he said were quite fresh. From the lateness of the season these must have been a second laying, the first very likely having been destroyed by a mowing-machine earlier in the summer. In former years I have had the remains of Quails' eggs brought to me mostly smashed to pieces by the mowing-machine in the haymaking time, but never so late as August. Although unfortunately so destructive to birds and eggs, the general use of the mowing-machine has shown that Quails breed with us in Somersetshire more frequently than is supposed. My acquaintance also showed me at the same time three or four clutches of Red-backed Shrikes' eggs taken in the neighbourhood, two I have no doubt taken in this parish (Bishops Lydeard), as I had previously noticed two pairs of Red-backed Shrikes, both of which I have no doubt had nests. I expected to hear of more Quails being shot about here in September than usual, but the only one I have seen or heard of was killed at Monkton on September 3rd. On the 29th of August a Greenshank was sent to me in the flesh and quite fresh from Huntspill, near Bridgewater. From the brown markings of the feathers of the back and upper parts, and the peculiar markings of the tail, I suppose this to have been a young bird of the year. On the 27th of September I received a letter from Mr. Edwards, of Wrington, in the eastern part cf this county, informing me that he had just killed an old hen Red Grouse at that place. So far as I know this is the only instance of the occurrence of the Red Grouse in Somersetshire, the only other within a moderate distance of which I am aware being the one recorded in Montagu's 'Ornithological Dictionary' as having been shot near Wedhampton, in Wiltshire, in the winter of 1794. I also received from Huntspill, early in September, a Grey Phalarope, a young bird of the year, but rather an early occurrence. From the same place also, at the same time, a Richardson's Skua in rather peculiar plumage. It is of the pale form and nearly adult, but, as usual at that time of year, in moult. The brownish band on the breast is fully developed; the chin, the lower part of the breast, and the belly are white; the flanks, however, are much clouded with grey, and the under tail-coverts more or less barred. The back and upper parts are mostly of the usual pale grey of the adult, but mixed with this pale grey are many darker grey feathers rather broadly tipped with white; these, from their unworn appearance, are new feathers fresh grown after the autumn moult, the old paler feathers being a good deal worn at the tips and sides; the tail-feathers are new feathers after the moult, and not half-grown. There are none of the yellow markings of the adult bird on the sides of the neck; the dark cap, however, is fully developed. My last note is on a Little Auk, which I saw at the birdstuffer's in Taunton on December 10th. It had been sent from Ilminster. and I suppose had been killed there, as it was in the flesh and quite fresh. The weather had been stormy, with a strong gale from the west to north-west, which would account for its being found so far inland. — Cecil Smith (Bishops Lydeard, Taunton).

Tree Sparrow nesting near Cromer.—I was not a little surprised at having a Tree Sparrow's nest last summer in our dry parish of Northrepps, far removed from marsh or stream, in the tiles of a cottage within one hundred yards of the front door. In thirteen years I have seen about a dozen of these birds, and, although I had in June last seen a couple for the first time at this season, I should not have thought of looking for their nest in a tiled roof. The nestlings were just ready to fly when discovered, and a fortnight afterwards I captured a young one in the garden, evidently one of the second brood. In Asia the Tree Sparrow is stated to nest habitually among houses, but my previous experience of its nests have been in trees and sheds by the water-side.—J. H. GURNEY, jun. (Northrepps, Norwich).

Notable Birds' Nests.—On April 19th I found a Kingfisher's nest, containing seven eggs, in the uprooted portion of a fallen poplar. In this neighbourhood of late years many poplars have been blown down, affording secure and favourite nesting-places for the Kingfisher; the hole in which the nest was placed was ten feet from the ground. On April 21st young Rooks were hatched. On May 5th a Nuthatch's nest with four eggs was found, about three feet from the ground, in an apple tree. On May 21st I was fortunate enough to take nearly four dozen Tree Sparrow's eggs in Cambridgeshire. The nests without exception were built in pollard willow trees. The variety in these eggs was very great; I obtained several quite light specimens, and there was one light egg with a clutch of dark ones in many instances. On May 30th a Wryneck's nest containing eight rather small eggs was found in the top of a perfectly dead pollard elm. On August 24th I found, amongst some potatoes with very little top on, being late in August, a Yellowhammer's nest containing three eggs; I call it a nest, but really it consisted of little but a few grasses, &c., bent round, for positively the three eggs were placed upon the hot, dry, dusty soil, and it was the most curious place I have ever seen for a Yellowhammer's nest. During the summer, at Martlesham, Suffolk, a Butcher Bird (before it could be destroyed) had taken over twenty young partridges, transfixing them up on the hedges in the vicinity. An unusual number of Bramblings have appeared this year on the beech trees.—E. CHARLES MOOR (The Rosery, Great Bealings, Woodbridge, Suffolk).

Lesser Black-backed Gull on the Yorkshire Coast.—In reply to the remarks of the Rev. Mr. Tuck and Mr. W. E. Clarke (p. 26), my statement that some climbers had eggs of this bird among their other spoils was simply given on their authority, as I myself am of opinion that the eggs of this species cannot be distinguished from those of the Herring Gull. I may mention, however, that the climbers in question could not have selected the clutch of three eggs (which they emphatically declared to me were those of the Lesser Black-backed Gull, as I questioned them closely respecting them) from any pecuniary point of view, for they did not ask any higher price for them. In our subsequent climbing excursions on the Filey cliffs we were always accompanied by one of these men, and he seemed to be well acquainted with the different species of sea-birds occurring on the coast, and when I asked him respecting the Lesser Black-backed Gull he said he only occasionally met with them breeding there, and could not be certain of finding their eggs every season, but was positive upon the point that this species does nest on the cliffs. I hope the question may be satisfactorily cleared up this year, and have little doubt but that our man's statement will prove to be correct. In reply to Mr. Clarke's remarks respecting the Rock Dove's eggs we took, I am certain the two clutches we were fortunate in obtaining were of this species, for in both cases we had a clear view of the bird, from above, as it left the nest. From one of the nests we had sent off the bird at least half a dozen times before we finally took the eggs, as we almost daily walked above the site. I appear to have omitted all mention of the Stock Dove in my paper somewhat unaccountably, for, on reference to my note-book, I find we constantly noticed its presence. We not only observed it on the cliffs, but we found a nest containing eggs in an old tree in one of the ravines running inland. —THOMAS CARTER (Burton House, Masham).

Reported Occurrence of the Short-toed Lark.—Referring to Mr. Fisher's note on the Short-toed Lark (p. 31), I must confess that to my mind the evidence adduced as to the authenticity of the specimen amounts at most only to a probability of its being British. Mr. Fisher is not perhaps aware that Short-toed Larks are imported by London dealers among Goldfinches from France and Spain. At all events, I could myself add the Serin Finch and Cirl Bunting to the Norfolk lists on similar evidence; or might register the Little Owl, Brambling, and Siskin as having bred in Devon, Essex, and North Wales on the strength of hand-reared specimens, which I was assured had been taken in those counties.—H. A. MACPHERSON (Carlisle).

Puffin in Nottinghamshire.—A daughter of the Rev. C. Wells, of Mansfield Woodhouse, picked up one of these birds alive on the road near that village in November, and kindly brought it over here for me. This is the first time this species has occurred in this county, so it will form a great addition to the county birds in my collection. It was a young bird of the year.—J. WHITAKER (Rainworth Lodge, Mansfield).

Uncommon Birds in Devon.—Early in January an adult male Golden-eye Duck was shot near Slapton, at Mr. Holdsworth's lea, also a female Gadwall on the Slapton Lea, the first of which we have any record in this neighbourhood. On Jan. 12th, on Slapton Lea, a fine male Egyptian

Goose was shot, the second we have ever known to occur in this district; the other was killed about twenty-five years since. I may also mention that a spotted Crake was sent to me from the Plymouth Market on Dec. 15th, quite fresh and in excellent condition; also a Landrail shot near here on Dec. 26th, which I believe is very late for both species, and the former of rare occurrence here, say one in five years.—R. P. Nicholls (Kingsbridge, Devon).

Night Heron in Scotland.—The Night Heron, *Nycticorax griseus* (L.), although having a very wide distribution, may be considered rather a rare visitant to Scotland, for during the present century only some seven specimens have been recorded to have been obtained there. The individual in question (an immature female) was caught in the beginning of November last at Loch Creran, Argyleshire, by Mr. W. Anderson Smith, of Ledaig. It was in an exhausted condition when taken, the result probably of the severe storms then prevalent, and lived only a few days, and on Nov. 14th was presented in the flesh to the Kelvingrove Museum, where it is now preserved The species has now been proved to be identical with that found in America, from which it was (till quite recently) said to differ.—J. M. Campbell (Kelvingrove Museum).

Interbreeding of the Thrush and Blackbird.—As this subject has been already referred to in the pages of 'The Zoologist' (1884, p. 146), I should like to draw attention to an apparent case of this kind, which, as Mr. J. H. Gurney, jun., has kindly pointed out to me, is recorded in Thompson's 'Natural History of Ireland' (vol. iii., Appendix, p. 456). He says:—" Another instance [of hybridity among birds] was made known to me in April, 1850, by Mr. Robert M. Austin, an eye-witness of the fact. At Waterloo Cottage, within a mile of Ayr, where this young gentleman resided, a female common Thrush (*T. musicus*) and a male Blackbird (*T. merula*) paired in the summer of 1849, built a nest in a small shrub, and produced three young in June, which were parti-coloured, having some black spots, the size of a sixpence, on their breasts. The notes of these young birds were frequently heard, and differed from those of Blackbird and Thrush by being more detached. Both parents are stated to have fed and tended the young. My attention was first called to this interesting circumstance by the Rev. W. M'Ilwaine, of Belfast, who happened to pay a visit to the place at the time." The foregoing would have been noticed in my article upon the subject in the 'Transactions of the Norfolk and Norwich Naturalists' Society' (vol. iii., part v., 1883-4, p. 588) had it come to light in time. I am inclined to think that it is one of those instances in which a female Blackbird may possibly have been mistaken for a Song Thrush. — Robert Miller Christy (Chignal St. James, near Chelmsford).

FISHES.

Salmon in the Hampshire Avon.—It is well known that this river is somewhat celebrated for the breeding of the Salmon in its waters, and doubtless many more fish would come up the stream if there were not certain obstacles to prevent them. I am informed that during last season no less than sixteen hundred salmon of various weights were taken in the so-called "run" at the mouth of the river, and four or five hundred more a few miles further up, besides the numbers that were taken with hook and line at Ringwood, and places still farther north. The Avon, like many other rivers, has suffered much from continued drought, and for a considerable time the lowness of the water was a topic of conversation, but with the first heavy rain there was a "flush" of the stream, and the Salmon—no doubt kept back by the shallowness—made a rush "up stream" in countless numbers, and the consequence is that at the present time (December 8th) the river is literally swarming with them, especially about the mills and hatches, where anything like an obstacle prevents their ascent, and the fish, in their eagerness to ascend, have in several instances thrown themselves out upon the land, or come to an untimely end by striking themselves against the obstructions named. In one instance a large fish was found dead, having forced itself so tightly into an aperture near one of the "ladders" that it was with difficulty extricated. Much to my regret, a continued indisposition prevented me from seeing the sight; but an old fisherman friend of mine who has known the river all his life says he never saw the like before. Previous to this it had been remarked how few fish had ascended the river for spawning, and possibly their retarded ascent had made them even more eager than usual to reach the gravel beds where Nature's law is fulfilled. Most of the fish, if not all of them, at present in the river are of the reddish hue peculiar to them at this season, and I believe it is a tint usually assumed by individuals whose stay in fresh water is at any time prolonged; and yet my old friend informs me that sometimes a fish, after the spawning season, will get as clear in appearance as a "fresh run" specimen, or, to use his expression, "as bright as a shilling," the truth of which I cannot gainsay. In many cases it is somewhat strange that men whose occupation is continually upon the river should have such a superficial knowledge of the fishes therein, but the above statement was made by a man who certainly knows the difference between a "clean" and an "unclean" fish. We are well aware that a lengthened stay in fresh water alters the condition and appearance of Salmon, but what fish are those which are caught in the first few weeks of the season, in February? Are they individuals who had previously spawned early and returned to the sea before the main body made their ascent? We can scarcely believe that the fishes, now so eager to ascend, are some of the same that will reward the angler in the cold days of February next, for in that case the spawning, the return to the sea, the improved condition, and subsequent ascent up the river, take but a comparatively short time. If, as is generally supposed, the fish eat nothing whilst in fresh water—nothing being found in the stomachs of those which are caught—their voracity on their return to the sea must be very great, and consequently their condition may be rapidly improved. It is well known that the longer a salmon stays in fresh water the weaker it gets, and possibly the salt water recruits its strength in a much more rapid ratio than the weakness assails it, yet the mere act of spawning must be a considerable item in the weakening process in the constitution of some of the poor emaciated individuals as they go back to the sea; and one would think its reparation would take more than a few weeks to accomplish. That the now spawning fishes, many of them, go back to the sea and return again into the fresh water plump and bright in the early spring, is an opinion shared by not a few who have an interest in the matter. It is a remarkable fact that, although the Avon and Stour empty themselves by one mouth into the sea, yet the Salmon, till within the last few years, almost shunned the Dorset stream for that of Hants, and, although at the present time the great majority of fish ascend the Avon, yet the numbers found in the Stour are annually increasing; but whether this arises from more anglers and a stricter investigation of the latter river I cannot say.—G. B. CORBIN (Ringwood, Hants).

Food of the Cod.—Referring to my previous remarks on this subject (p. 34) I may add that I have to-day (Jan. 19th) taken from the stomach of a Common Cod a very large specimen of *Scyllarus arctus*, and a small Velvet Swimming Crab (*Portunus puber*). The Cod in question was caught in the Bay here. The measurement of the specimen of *Scyllarus arctus* were:—Over all, five in. six-sixteenths; across the carapace, one in. six-sixteenths; length of exterior antennæ (included in "over all"), fourteen-sixteenths in.; breadth of each of them, eleven-sixteenths in. — THOS. CORNISH (Penzance).

Flight of the Flying Fish.—In 'The Zoologist' for 1880 (pp. 471–481) appeared an article on this subject by C. O. Whitman, and in the succeeding volume for 1881 notes by Capt. Hadfield (p. 68), Mr. D'Urban (p. 146), and Mr. Pascoe (p. 147), all contributing information from personal observation. In a recent letter to 'Nature' (1st January, 1885) Prof. Möbius writes as follows:—"Flying Fish are incapable of flying, for the simple reason that the muscles of their pectoral fins are not large enough to bear the weight of their body aloft in the air. The pectoral muscles of birds depressing their wings weigh, on an average, one-sixth of the total weight of the body, the pectoral muscles of bats one-thirteenth, the muscles of the pectoral fins of Flying Fish only one-thirty-second. The impulse to which Flying Fish owe their long shooting passage through the air is delivered, while they are still in the water, by the powerful masses of muscle on both sides of their body, which are of much greater breadth than in the case of the Herring or any other fish of their own size."

MOLLUSCA.

Rossia macrosoma in Argyleshire.—A fine specimen of this rare little Cephalopod was taken in the dredge during the summer of 1884 in Loch Creran by Mr. W. Anderson Smith, and sent by him to Kelvingrove Museum, Glasgow. This is the first time it has been taken in the West Highlands, so far as I am aware.—J. M. Campbell (Kelvingrove Museum).

Erratum.—Through an unfortunate confusion of identity I described my sketch of a monstrosity, in the December number of 'The Zoologist,' as *Buccinium undatum;* of course it should be *Fusus antiaus*, which is at once palpable from the figure itself. — Edward Lovett (Addiscombe, Croydon).

Errata.—In my paper on Surrey Mollusca the following errata occur: —Page 13, lines 4 and 15 from top, for "Oxstead" read "Oxsted." Page 14, line 9 from top, for "*Cornulus*" read "*Conulus*." Line 18, "*Planorbis glaber* at Paddock Wood"; it is possible that these may be merely a var. of *P. albus*. Line 19, for "*gagatis*" read "*gagates*"; I have recently taken this in Middlesex.—T. D. A. Cockerell.

SCIENTIFIC SOCIETIES.

Linnean Society of London.

December 18, 1884.—Sir John Lubbock, Bart., F.R.S., President, in the chair.

The following gentlemen were elected Fellows of the Society:—Lieut.-Col. W. Rowe Lewis, Dr. Chas. B. Plowright, Messrs. Thos. B. Blow, H. G. Greenish, A. G. Howard, Lionel de Nicéville, and Fred. Shrivell.

Mr. Edw. Alfred Heath exhibited a stuffed adult specimen of the Wild Cat, which had been found dead in a trap (November, 1884) in Ben-Armin Deer Forest, Sutherlandshire, in which district they still are frequently met with.

Prof. St. G. Mivart read a paper on the convolutions of the brain in the Carnivora and Pinnipedia, describing for the first time in detail the brains of *Nandinia*, *Galidia*, *Cryptoprocta*, *Bassaricyon* (from a cast of the skull), *Mellivora*, *Galictis*, and *Grisonia*. Confirming the views of previous observers, the author gave additional reasons for a three-fold division of the Carnivora into *Cynoidea*, *Æluroidea*, and *Arctoidea*, though he remarked that amongst the Æluroids the section of *Viverrina* formed a very distinct group, judged by the cerebral characters. He specially called attention to the universal tendency amongst the *Arctoidea* to the definition of a distinct and conspicuous lozenge-shaped patch of brain-substance defined by the crucial and precrucial sulci. This condition, which he found in no single non-arctoid carnivore, he also found in the brain of *Otaria Gillespii*, and afterwards in *Phoca vituliua*, where it is very small and much hidden. This fact he adduced as an important argument in favour of the view that the Pinnipedia were evolved from some Arctoid, probably Ursine form of Land Carnivora.

In illustration of some ornithological notes, Mr. T. E. Gunn showed an interesting series in varied plumage of the Blue-throated Warbler (*Ruticilla suecica*, Linn.) The examples in question were procured by Mr. G. E. Power at Cley, on the Norfolk coast, in the second week of September last. Mr. Gunn also exhibited an immature female specimen of the Little Bittern (*Botaurus minutus*), shot by Mr. E. N. Benningfield at Broxbourne Bridge, Herts, on October 15th; as likewise a hybrid between a cock Goldfinch and hen Bullfinch, possessing the marked characteristics of both parents.—J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

January 20, 1885.—Prof. W. H. FLOWER, LL.D., F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of December, 1884, and called attention to a Muntjac from Ningpo, China, deposited by Mr. H. E. Dresser on December 20th, which appeared to belong to a species distinct from any yet described, and which was proposed to be called the Hairy-fronted Muntjac, *Cervulus crinifrons*, sp. n.; and to a young male Nubian Ibex, *Capra nubiana*, presented December 30th by Mrs. Laing, of Thornhill, Sunderland, which was stated to be new to the Society's Collection.

Mr. Sclater called attention to the breeding of a pair of the Chinese Blue Magpie in the Society's Gardens in 1884, and exhibited specimens of their eggs.

Prof. Bell exhibited some models illustrating a paper by Rathke on the development of the great blood-vessels in the Vertebrata.

Mr. Tegetmeier exhibited a specimen of the Wild Cat, *Felis catus*, from Donegal, and an example of a singular variation in plumage of the Black Grouse, *Tetrao tetrix*.

A paper was read by Dr. P. Pelseneer on the coxal glands of *Mygale*. Dr. Pelseneer's observations had been made on a large specimen of *Mygale* of the subgenus *Theraphosa* received from the Society's Gardens. The form and position of this organ in the Arachnides had not been previously described or figured.

Mr. E. J. Sidebotham read a description of the muscular system of the Water-Opossum (*Chironectes*), as observed in a specimen of this Marsupial which he had recently dissected.

A paper was read by Mr. G. A. Boulenger containing the description of a new species of Frog from Asia Minor, belonging to the section *Ranæ temporariæ*. This was proposed to be called *Rana macrocnemis*.

A communication was read from Dr. O. Boettger containing the descriptions of five new species of Shells of the genus *Bulimus*. The specimens upon which these descriptions were based had been collected by Vice-Admiral T. Spratt in various parts of the Levant.

A communication was read from Mr. J. H. Thomson contianing the description of a new species of mollusk of the genus *Hyalina* obtained at the island of Vaté, New Hebrides, by Mr. E. L. Layard, which he proposed to call *Hyalina* (*Conulus*) *layardi*.

Dr. Gwyn Jeffreys read the ninth of his series of papers on the Mollusca of the 'Lightning' and 'Porcupine' Expeditions. This part included the representatives of the families from Ianthinidæ to Cerithiopsidæ, with seventy-five species, of which twenty-three were new to science. One new genus (*Stilus*) was also described.—P. L. Sclater, *Secretary*.

Entomological Society of London.

December 3, 1884.—J. W. Dunning, Esq., M.A., F.L.S., &c., President, in the chair.

Baron C. R. Osten-Sacken (Haus Mai, Heidelberg) was balloted for and elected an Honorary Member of the Society; and James J. Walker, Esq., R.N., a Subscriber, was elected an Ordinary Member.

Mr. H. T. Stainton exhibited specimens of *Goniodoma Millierella*, bred from *Statice virgata* in the South of France, recently received from M. Constant, and British specimens of *G. auroguttella*, Fisch.-Rössl., bred from *Atriplex laciniata*, for comparison. Although Mr. Stainton quite believed they were distinct species, he had as yet failed to find an appreciable character to separate them. Specimens of *G. limoniella*, bred from *Statice Limonium*, were also exhibited.

Mr. H. Goss exhibited specimens of *Bankia argentula*, Hübn., from a new locality on the borders of Cambridgeshire and Suffolk; also a drawing of the larva of this species, received from Mr. Brown, of Cambridge. The drawing represented the larva as feeding on some species of grass apparently belonging to the genus *Festuca*, though, according to Mr. Buckler, the larva feeds on some species of *Poa*.

Mr. R. M'Lachlan said it would be interesting to British entomologists to know that *Tapinostola Bondii*, Knaggs, had occurred on the island of Rügen in the Baltic (Stett. Ent. Zeit. xlv. 432); it was only known previously from Central Greece and Britain.

Mr. W. F. Kirby alluded to *Noctua subrosea*, Steph., as another British moth with very limited distribution (Britain, Livonia, Finland).

Mr. J. Jenner Weir, on behalf of Mr. E. Lovett who was present as a visitor, exhibited a collection of Micro-Lepidoptera from the neighbourhood of Grahamstown, Cape Colony, and made some remarks on their great resemblance to British species. They were collected by Mr. H. F. Billinghurst.

Mr. T. R. Billups exhibited specimens of Aculeate Hymenoptera captured at Chobham during the past season; also Ichneumonidæ, &c., collected in various localities during 1884.

Mr. H. J. S. Pryer contributed a paper "On two remarkable cases of mimicry from Elopura, British North Borneo, with remarks on Mr. George Lewis' paper read before the Society on 4th October, 1882." The cases of mimicry referred to was that of a large coleopteron (*Nothopeus fasciatipennis*, n. s., C. O. Waterhouse) mimicing an equally large hymenopteron (*Mygnimia aviculus*, Sauss.), and of a large lepidopteron (*Scoliomima*, n. g., Butler, *insignis*, n. s., Butler) mimicing a large hymenopteron (*Triscolia patricialis*, Burm.).

Mr. A. G. Butler made some remarks upon the very interesting cases of mimicry alluded to, and contributed a description of the moth, for which he formed a new genus of *Ægeriidæ*, coming next to the African genus *Toosa* (= *Ninia*). He also referred to the remarkable mimetic resemblance between the two species of *Myrmecopsis*, Newman, with their distinctly petiolated abdomen, and species of *Polybia* or *Agenia*. Mr. Butler said it was both interesting and curious to find that in India the female *Argynnis Niphe*, Linn., mimics *Danais Chrysippus*, Stoll; while in Australia the sexes of the representative of *A. Niphe* (*A. inconstans*, Butl.) are similar, the Australian *Danais* being so small that it is not worth mimicing. The well-known case of *Papilio Merope*, Cram., was also interesting: furthermore, that the *Catocalinæ* were directly opposed to Mr. Lewis' views, since the upper surface of the hind wings, which are least exposed to the action of the sun's rays, are the most brilliantly coloured portion of these insects.

Mr. C. O. Waterhouse remarked upon and exhibited specimens of the following two cases of mimicry: a species of *Myocoris* (Hemiptera) and a species of *Joppa* (Hymenoptera) from the Amazons; a dipteron allied to *Dasypogon*, the hymenopterous *Abispa australis*, and the coleopterous *Hesthesis ferrugineus*, M'L., from Australia. Mr. Butler said the lepidopterous genus *Dycladia* would complete the trio in the first-mentioned case. Mr. Waterhouse did not think it possible that the Longicorn could be parasitic on the wasp, as was suggested by Mr. Pryer. Mr. Fitch thought if there was any community of habitat it would be that the wasp nested in the burrows of the Longicorn.

Several members took part in a discussion upon the various points raised by Mr. Pryer's criticism of Mr. Lewis' paper.—E. A. Fitch, *Hon. Sec.*

NOTICES OF NEW BOOKS.

British Oribatidæ. By Albert D. Michael, F.L.S., F.R.M.S. 8vo. pp. 336, with 39 plates. London: printed for the Ray Society. 1884.

It is fortunate for biologists that there exists such an excellent medium for the publication of scientific works on Zoology and Botany as the Ray Society; for it is certain that were it not for the aid which this Society extends, many important works requiring to be expensively illustrated would never see the light. The class to which works of this nature appeal is confessedly a small one, hence the difficulty which arises in finding a publisher willing to undertake the cost of their production. The Ray Society, in such cases, comes to the rescue, and, by the aid of the funds annually raised by the subscription of its members (an insignificantly small subscription when compared with the value of the volumes annually issued), secures the publication of treatises which otherwise would never appear, and which in many instances must have cost the authors years of unrequited labour.

To this important series another volume, on the British *Oribatidæ*, has just been contributed by Mr. A. D. Michael.

The ordinary English name for the *Oribatidæ* is "beetle-mites," but it is an unfortunate one, because it gives many people the idea that they are parasitic upon beetles, and that the so-called species *Acarus coleopterorum* of Linnæus is a type of the *Oribatidæ*, whereas this creature belongs to an entirely different family, *viz.*, the *Gamasidæ*.

The name of "beetle-mite" has no doubt been given from the general resemblance in appearance of many, indeed most, of the species to beetles. This resemblance is, however, probably little more than superficial, as in most essential points the *Gamasidæ* are more closely allied to the true Insects than the *Oribatidæ*, the first pair of legs being true walking legs in the *Oribatidæ*, and not used for any other purpose, whereas in the *Gamasidæ* they are usually tactile organs, little, if at all, used for locomotion, and, although pediform in shape and size, they are really more closely allied to palpi, and are placed in close proximity to the mouth organs.

The term *Oribatidæ*, from *oribata*, is, as Mr. Michael remarks, euphonious, but we fail to see its applicability, except upon the *lucus a non lucendo* principle, since it is derived from the Greek words ὅρος, a mountain, and βαίνω, I go. Seeing the rate of progress at which these tiny creatures travel, the ascent of a mountain would be more than a life-long task. It is possible, as Mr. Michael suggests, that Latreille, the proposer of the name *Oribata* in 1804, may have based it not directly upon ὅρος and βαίνω, but upon the proper name *Oribasus*, Actæon's dog, derived from these two words. At any rate *Oribata* is the name which has come to be universally employed for these Acarids, to the exclusion of Hermann's name *Notaspis*, bestowed the same year.

The *Oribatidæ* are all of microscopic size, the largest species known being not more than the twentieth of an inch in length, while the smallest are under a fifth of that measurement. It will be readily understood that this very small size renders it extremely difficult to ascertain their structure or to study their life-histories, particularly as they possess in the adult stage a chitinous exoskeleton of unusual brittleness, and often so black and rough that a very high concentration of light is necessary to see them properly, while the necessity for using moderately high amplifying powers renders strong reflected light more difficult to obtain; and moreover strong light is most unwelcome to the creatures, almost all of which live in comparative darkness, and avoid the light as much as possible.

These and other difficulties, however, Mr. Michael, by unwearied patience and careful manipulation, has contrived to overcome; and, by keeping specimens under observation in a living state, he has succeeded in watching them through the various stages to the adult condition, tracing their development and noting many a curious fact in their life-history.

Dissecting them under the microscope, he has carefully ascertained the nature of their structure, which he has illustrated in detail in a series of beautifully-executed plates, and, in dealing with their life-history, has furnished an account which rivals in interest Darwin's observations on the habits of Earthworms, and Sir John Lubbock's experiments on Ants and Bees.

In marked contradistinction to all other groups of *Acarina*, the *Oribatidæ* at every stage of their existence are free organisms, not in any way parasitic, and not looking for any host either for nutriment or conveyance.

All the members of the family appear to be vegetable feeders, although Mr. Michael seems to be a little doubtful about *Pelops*, and none of them have been found to be injurious to man or his works. Their respiration is tracheal. They are extremely slow in their movements, sometimes remaining motionless for hours, and it is not always easy to distinguish some of the immature ones from the vegetable substances upon which they feed. A French naturalist, M. Nicolet, has taken the trouble to calculate the rate of progress of several species, and Mr. Michael has reproduced his table of results, believing them to be "fairly correct."

The amount of information elicited by patient research, and made known in the work before us, shows how much there is to learn about living creatures of whose very existence probably many people until now have been quite unaware.

Nests and Eggs of Australian Birds. By ARCHIBALD J. CAMPBELL. 8vo, pp. vi; 72; xxx. Illustrated with photographs of the eggs. Melbourne: published by the author.

THE mode of nidification and the character of the egg furnish such important indications of the nest-builder's affinities with other species, that well-authenticated specimens of the eggs of little-known birds are always welcome additions to a collection formed with a scientific object.

Of the nidification of Australian birds we still know, comparatively speaking, very little; for, although Gould described the eggs of a large number of species (about 262 according to Mr. Campbell out of the 670 mentioned in his 'Birds of Australia,') and Mr. E. P. Ramsay has since described between twenty and thirty more, this is but a very small proportion of the number of Australian birds whose breeding habits prior to the publication of Mr. Campbell's work were unknown to naturalists in this country.

In the work now before us, to quote the author's own words (Introduction pp. iii-iv), " Descriptions and dimensions are given of about 413, or nearly all the known, Australian eggs, 262 being taken from Mr. Gould's celebrated work on the Birds of Australia. The balance 151 were unknown to him or his collectors; of these 122 are described from authenticated specimens in my own collection, twenty-four from Mr. E. P. Ramsay's papers, and five from other authors."

The book is illustrated with full-page photographs of eggs (ten to sixteen on a page), all presumably of the natural size, and useful therefore as showing their relative proportions and the character of their respective markings.

It would be well, we think, if Mr. Campbell had confined his descriptions to the eggs of such birds as actually breed in Australia, omitting those which are only found there as accidental visitors. For instance, why describe the eggs of such well-known species as the Grey Plover, Ringed Dotterel, Common Sandpiper, and Greenshank, which are only stragglers to the Antipodes in winter, and whose eggs have already been described by other writers? We should like to know from what specimens (one or more) Mr. Campbell wrote down his description of the egg of the Curlew Sandpiper, *Tringa subarquata*, which species he notes as having occured in Australia, Tasmania, and New Guinea. The egg marked as "previously undescribed," is thus depicted:— "Somewhat pyriform in shape; ground colour of a dull yellowish olive, or buff stone, fairly marked all over with round well-defined spots of umber of different shades, varying from very light to very dark. Length, 1 inch 2½ lines; breadth, 11 lines."

The photograph of this egg (No. 523) gives the idea of its being somewhat too small for the bird, bearing in mind the size of that laid by its relative the Dunlin, *Tringa alpina*. No description of the nest is given, nor any indication of the locality whence the specimen was obtained.

Here and there Mr. Campbell gives an interesting sketch of the situation in which a particular species is to be looked for. Take, for instance, his account of the haunts of the Victoria Lyre-bird, *Menura victoriæ*, which we will here quote:—

> "The toil attending the search for Lyre-birds' nests, of all nesting out, is the most arduous, and must be experienced to be fully realised; because, firstly, these curious birds incubate in August, one of our wettest months of the year, consequently terribly boggy and greasy tracks have to be travelled; secondly, the nature of the country to be scoured is of the roughest and wildest that Gippsland can produce. You have to thread your way through thickly-studded hazel-tree scrub, with wet cat-head ferns up to your knees; then to tear through rank, rasping sword-grass which cuts your very clothes, not unfrequently nastily gashing your unprotected hands and face; next, entangled in a labyrinth of wire-grass holding you at every step, and hiding treacherous slippery logs, on one of which perhaps your right foot slips, causing you to perform a species of 'double-shuffle' with your left in order to preserve your equilibrium, which, however, is as often destroyed as not, and, as a natural consequence and *finale* to the 'break-down,' you land on your side with a grunt, and wallow amongst rank vegetation. To climb the opposite hill you cross on 'all-fours' a wet saturated log which naturally bridges the gully: in accomplishing this awkward task, overhanging tree-fern fronds dash in your face, drenching you nearly as much as if some individual had thrown a pail of water over you. Notwithstanding the chilly weather there is always a humidity in these forests, and with such wholesome exercise you are soon bathed in perspiration, and gladly halt now and again for breathing-time at the head of some lovely gully where the scrub is not so dense, and you stand in one of Nature's silent picturesque temples. . . . . Here the awful stillness of an Australian forest is hardly broken save by the somewhat soothing sound of a continual hissing and surging of the sea of *Eucalypti* foliage, some 200 feet towards the zenith, the chirp of the Yellow Robin, or a beautiful *cadenza* from a Lyre-bird down the gully."

As a contribution to Oology we doubt not that Mr. Campbell's book will be acceptable to many in this country, while in Australia it will be very useful in showing collectors what yet remains to be done. If, as the author supposes, some three hundred eggs of Australian birds have yet to be described, there is indeed a fine field for exploration open to young and ardent ornithologists.

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